



PSYCHE.

ORGAN OF THE CAMBRIDGE ENTOMOLOGICAL CLUB

EDITED BY GEORGE DIMMOCK AND B. PICKMAN MANN.

Vol. II.] Cambridge, Mass., July-Aug., 1877. [Nos. 39-40.

On the Structure of the Head of *Atropos*.

The inner lobe of the maxillæ of the Psocidae has always been described, so far as I can learn, as a simple, unjointed, horny stem. Thus Burmeister¹ says it is a slender horny piece like a fish bone, which lies deeply imbedded in the base of the jaw, is sharply separated from the galea, and, when the mouth is closed, often projects near the labium. Westwood² describes the same part as a long, slender, curved, horny process, arising from the base, and longer than the maxillæ, and figures the same (fig. 59.4, p. 18) as a nearly straight and simple unjointed rod, with a bifid tip. Latreille also gives a similar account of its structure. The special monographers of the family seem never to have given any general outline of the structure common to the group, but have limited themselves to those features wherein its members differ from one another; I cannot find any allusion by them to the special composition of the maxillæ.

A specimen before me, found in a mass of clay lately taken from an interglacial deposit near Toronto in Canada, but which, was probably accidentally introduced after the removal of the deposit, is remarkably free from discoloration and the grayish particles usually accompanying mounted specimens of *Atropos*. This specimen shows a structure of the inner lobe different from that hitherto described, and repeated examinations of fresh specimens have left no doubt that the structure has been

¹ Handb. d. Entom., ii, 722.

² Modern Class. Ins., ii, 17. It may be remarked that Westwood correctly describes the outer maxillary palpus as four jointed, although he figures it with six joints.

misunderstood. Instead of forming a single, simple, rod-like process, this inner lobe is three or four times as long as has been presumed and is two-jointed, the apical joint lying, when the organ is at rest, beside the basal joint, which is attached to the maxilla at the extreme base of the latter; the basal joint is directed backward and lies almost directly beneath the basal portion of the apical joint. The two portions of the inner lobe which lie, when at rest, behind the base of the maxilla are the parts which have been overlooked; the cause of the oversight is that they are less corneous than the distal half of the apical joint, and that they connect with the maxilla almost directly below the tendinous attachments of the muscles of the head to the inner base of the jaws, with which, from the transparency and minute size of the creature, they may readily be confounded in an object mounted for the microscope; the distal half of the apical joint has therefore been taken for the entire inner lobe.

This same structure, first seen in *Atropos*, appears also in *Rhyopsocus*, recently described by Dr. Hagen from Kerguelen Island, of which he says¹ "the long horny stem straight, bifid on tip, exterior branch [of the bifid tip] a little longer." I have not been able to examine any mounted *Psocina*, to see whether the inner lobe is similarly constructed in the other branch of the family, but it hardly seems possible that it can be otherwise; for it is not easy to conceive how a bifid, corneous rod could be used, if simply attached as a process to a maxilla moving at right angles to the longer axis of the process. As a jointed organ, capable of being bent upon itself, it could be thrust suddenly forward to spear any object with the tines of its microscopic fork. It is, however, curious that, when at rest, the two joints are folded so closely together, that in more than twenty mounted specimens which I first examined they were in almost precisely the same position, and in no instance was the portion of the apical joint which crossed the maxilla removed outwardly so far as to lie wholly beyond it. This led me at first to doubt whether the parts I saw behind the maxilla really belonged to this inner lobe, but in every case where the parts were not ob-

¹ Bull. U. S. Nat. Mus., iii, 53.

scured, their direct connection could be unmistakably traced : this appearance is due simply to the invariable assumption by these organs of their natural attitude of rest. Having therefore followed these bifid stems to the maxillæ, writers have been content to leave them there, and have not traced them in their more transparent parts, which were first clearly seen by me in the specimen from Toronto. In specimens afterwards mounted under pressure to separate the parts, the true character of the inner lobe of the maxilla was proved beyond a doubt ; for the jointed stem, still preserving its connections throughout, became elbowed, and the apical joint was thrown so far to one side as not to cross any part of the maxilla.

The eyes of *Atropos* differ remarkably from those of other Psocidae. As is well known, the *Atropina* generally are distinguished from the *Psocina* by the absence of ocelli ; and in many forms throughout the family (especially in the males, as Dr. Hagen informs me), the compound eyes appear to be only an agglomeration of simple ocelli, each facet being strongly convex, and the whole mass resembling a bunch of grapes. This is the case also in the specimen of *Rhyopsocus* referred to, which is a female, and is believed by Dr. Hagen to belong to the *Atropina* ; so that the characteristic of *Atropos* now to be mentioned is not shared by all the other members of the *Atropina*. The eyes of *Atropos* are extremely simple, and indicate a low organization ; generally their form and composition are extremely difficult to make out because of the amount of pigment in the field where they are situated ; but in the specimen from Toronto the eyes are unusually distinct and uninjured, so that their structure is perfectly clear ; they consist merely of a row of three simple, equal, contiguous ocelli, on either side, placed in a straight, oblique line next to the outer margin of the under surface of the head just behind the middle, the outer one upon the margin itself ; the line is directed toward the base of the mandibles, and the whole row is as long as the second antennal joint. This is the simplest form of eye which is known to me in a perfect insect ; indeed it would be difficult to imagine anything much simpler.

Samuel H. Scudder.